TCEQ Interoffice Memorandum

To: Tony Walker

Director, TCEQ Region 4, Dallas/Fort Worth

Alyssa Taylor

Air Section Manager, TCEQ Region 4, Dallas/Fort Worth

From: Manuel Reyna MSR

Toxicology Division, Office of the Executive Director

Date: December 18, 2012

Subject: Toxicological Evaluation of Results from an Ambient Air Sample for Volatile Organic Compounds Collected Downwind of Devon Energy Production Co. – Devon Casto Industrial Complex (Latitude 33.15845, Longitude -97.25890) near Ponder, Denton County, Texas

Sample Collected on September 26, 2012, ACL 1210011 (Lab Sample 1210011-001)

Key Points

- The reported concentration of p-diethylbenzene exceeded its odor air monitoring comparison value (AMCV) (Table 1). The concentration for this chemical would be expected to cause an odor. Persistent or recurrent exposure to concentrations, which significantly exceed the odor threshold, may cause odor-related health effects in some individuals, including nausea and headache. The remaining volatile organic compounds (VOCs) were either not detected or were detected below their respective short-term AMCVs, and would not be expected to cause short-term adverse health effects, vegetative effects, or odors.

Background

On September 26, 2012, a Texas Commission on Environmental Quality (TCEQ) Region 4 air investigator collected a 30-minute canister sample downwind of Devon Energy Production Co. - Devon Casto Industrial Complex near Ponder, Denton County, Texas (Latitude 33.15845, Longitude -97.25890). The sample was collected in response to an odor complaint. The citizen complained of a strong odor. The investigator experienced a strong intermittent hydrocarbon odor. Meteorological conditions measured at the site or nearest stationary ambient air monitoring site indicated that the ambient temperature was 92.5°F with a relative humidity of 44.7%, and winds varied from the south-southeast to the southwest (160° to 220°) at 5.7 to 6.3 miles per hour. The sampling site was less than 100 feet from the possible emission source (salt water disposal well). The nearest location where the public could have access was 301 to 500 feet from the possible emission source. The sample was sent to the TCEQ laboratory in Austin, Texas, and analyzed for a range of VOCs. The list of the target analytes that were evaluated in this review are provided in Attachment A. The VOC concentrations were reported in parts per billion by

volume (ppb_v) (Attachment B and Table 2). Please note that the available canister technology and analysis method cannot capture and/or analyze for all chemicals.

Results and Evaluation

Reported VOC concentrations were compared to TCEQ short-term health- and/or welfare-based AMCVs (Table 2). Short-term AMCVs are guidelines used to evaluate ambient concentrations of a chemical in air and to determine its potential to result in adverse health effects, adverse vegetative effects, or odors. Health-based AMCVs are set to provide a margin of safety, and are set well below levels at which adverse health effects are reported in the scientific literature. If a chemical concentration in ambient air is less than its comparison value, no adverse health effects are expected to occur. If a chemical concentration exceeds its comparison value it does not necessarily mean that adverse effects will occur, but rather that further evaluation is warranted.

With the exception of p-diethylbenzene, all of the 84 VOCs were either not detected or were detected below their respective short-term AMCVs. Exposure to the reported concentrations of the 84 VOCs would not be expected to cause short-term adverse health effects, adverse vegetative effects, or odors.

The reported concentration of p-diethylbenzene exceeded its odor-based AMCV (Table 1). The reported concentration could cause an odor. Persistent or recurrent exposure to concentrations which significantly exceed the odor threshold may cause odor-related health effects in some individuals, including nausea and headache.

Please call me at (512) 239-3444 if you have any questions regarding this evaluation.

Table 1. Exceedance in Lab Sample 1210011-001

Chemical	**Measured Concentration (ppb_v)**	**Short-term Health AMCV (ppb_v)**	**Short-term Odor AMCV (ppb_v)**	**Does it exceed the short-term health-based AMCV?**	**Does it exceed the short-term odor-based AMCV?**
p-diethylbenzene	1.4	460	0.39	No	Yes

Attachment A

List of Target Analytes for Canister Samples

ethane	4-methyl-1-pentene	t-1,3-dichloropropylene
ethylene	1,1-dichloroethane	1,1,2-trichloroethane
acetylene	cyclopentane	2,3,4-trimethylpentane
propane	2,3-dimethylbutane	toluene
propylene	2-methylpentane	2-methylheptane
dichlorodifluoromethane	3-methylpentane	3-methylheptane
methyl chloride	2-methyl-1-pentene + 1-hexene	1,2-dibromoethane
isobutane	n-hexane	n-octane
vinyl chloride	chloroform	tetrachloroethylene
1-butene	t-2-hexene	chlorobenzene
1,3-butadiene	c-2-hexene	ethylbenzene
n-butane	1,2-dichloroethane	m & p-xylene
t-2-butene	methylcyclopentane	styrene
bromomethane	2,4-dimethylpentane	1,1,2,2-tetrachloroethane
c-2-butene	1,1,1-trichloroethane	o-xylene
3-methyl-1-butene	benzene	n-nonane
isopentane	carbon tetrachloride	isopropylbenzene
trichlorofluoromethane	cyclohexane	n-propylbenzene
1-pentene	2-methylhexane	m-ethyltoluene
n-pentane	2,3-dimethylpentane	p-ethyltoluene
isoprene	3-methylhexane	1,3,5-trimethylbenzene
t-2-pentene	1,2-dichloropropane	o-ethyltoluene
1,1-dichloroethylene	trichloroethylene	1,2,4-trimethylbenzene
c-2-pentene	2,2,4-trimethylpentane	n-decane
methylene chloride	2-chloropentane	1,2,3-trimethylbenzene
2-methyl-2-butene	n-heptane	m-diethylbenzene
2,2-dimethylbutane	c-1,3-dichloropropylene	p-diethylbenzene
cyclopentene	methylcyclohexane	n-undecane

Attachment B

10/12/2012

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087, MC-165
Austin, Texas 78711-3087
(512) 239-1716

Laboratory Analysis Results
Request Number: 1210011

Request Lead: Region: T04 Date Received: 10/4/2012
Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
Devon Energy Production Company LP	Ponder	Denton	

Sample(s) Received

Field ID Number: 20296-092612 Laboratory Sample Number: 1210011-001 Sampled by: Glendora Lopez
Sampling Site: Devon Casto Industrial Complex Date & Time Sampled: 09/26/12 14:04:00 Valid Sample: Yes
Comments: Canister 20296 was used to collect a 30-minute downwind sample using OFC-065. Non-conformance: field staff did not indicate method of transfer of canister after initial relinquishment.

Requested Laboratory Procedure(s):

Analysis: AP001VOC
Determination of VOC Canisters by GC/MS Using Modified Method TO-15

Please note that this analytical technique is not capable of measuring all compounds which might have adverse health effects. For questions on the analytical procedures please contact the laboratory manager at (512) 239-1716. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: Jaydeep Patel Date: 10/12/12
Jaydeep Patel

Laboratory Manager: Cindy Marsh Date: 10/15/12
Cindy Marsh

Laboratory Analysis Results
Request Number: 1210011
Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1210011-001									
Field ID	20296-092612									
Canister ID	20296									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
ethane	36	1.0	2.4	10/6/2012	T,DI					
ethylene	1.7	1.0	2.4	10/6/2012	L,T,DI					
acetylene	0.93	1.0	2.4	10/6/2012	J,T,DI					
propane	5.8	1.0	2.4	10/6/2012	T,DI					
propylene	0.32	1.0	2.4	10/6/2012	J,T,DI					
dichlorodifluoromethane	0.51	0.40	1.2	10/6/2012	L,DI					
methyl chloride	0.68	0.40	1.2	10/6/2012	L,DI					
isobutane	1.7	0.46	2.4	10/6/2012	L,DI					
vinyl chloride	ND	0.34	1.2	10/6/2012	DI					
1-butene	0.32	0.40	1.2	10/6/2012	J,DI					
1,3-butadiene	ND	0.54	1.2	10/6/2012	DI					
n-butane	2.9	0.40	2.4	10/6/2012	DI					
t-2-butene	ND	0.36	1.2	10/6/2012	DI					
bromomethane	0.01	0.54	1.2	10/6/2012	J,DI					
c-2-butene	0.01	0.54	1.2	10/6/2012	J,DI					
3-methyl-1-butene	ND	0.46	1.2	10/6/2012	DI					
isopentane	2.6	0.54	4.8	10/6/2012	L,DI					
trichlorofluoromethane	0.26	0.58	1.2	10/6/2012	J,DI					
1-pentene	ND	0.54	1.2	10/6/2012	DI					
n-pentane	3.2	0.54	4.8	10/6/2012	L,DI					
isoprene	0.06	0.54	1.2	10/6/2012	J,DI					
t-2-pentene	ND	0.54	2.4	10/6/2012	DI					
1,1-dichloroethylene	0.01	0.36	1.2	10/6/2012	J,DI					
c-2-pentene	ND	0.50	2.4	10/6/2012	DI					
methylene chloride	0.06	0.28	1.2	10/6/2012	J,DI					
2-methyl-2-butene	0.01	0.46	1.2	10/6/2012	J,DI					
2,2-dimethylbutane	0.17	0.42	1.2	10/6/2012	J,DI					
cyclopentene	0.01	0.40	1.2	10/6/2012	J,DI					
4-methyl-1-pentene	ND	0.44	2.4	10/6/2012	DI					
1,1-dichloroethane	ND	0.38	1.2	10/6/2012	DI					
cyclopentane	0.20	0.54	1.2	10/6/2012	J,DI					
2,3-dimethylbutane	0.28	0.56	2.4	10/6/2012	J,DI					
2-methylpentane	2.7	0.54	1.2	10/6/2012	DI					
3-methylpentane	2.0	0.46	1.2	10/6/2012	DI					
2-methyl-1-pentene + 1-hexene	ND	0.40	4.8	10/6/2012	DI					
n-hexane	5.7	0.40	2.4	10/6/2012	DI					
chloroform	ND	0.42	1.2	10/6/2012	DI					
t-2-hexene	ND	0.54	2.4	10/6/2012	DI					
c-2-hexene	ND	0.54	2.4	10/6/2012	DI					
1,2-dichloroethane	0.02	0.54	1.2	10/6/2012	J,DI					
methylcyclopentane	1.4	0.54	2.4	10/6/2012	L,DI					
2,4-dimethylpentane	0.34	0.54	2.4	10/6/2012	J,DI					
1,1,1-trichloroethane	0.01	0.52	1.2	10/6/2012	J,DI					
benzene	1.1	0.54	1.2	10/6/2012	L,DI					
carbon tetrachloride	0.09	0.54	1.2	10/6/2012	J,DI					
cyclohexane	3.1	0.48	1.2	10/6/2012	DI					
2-methylhexane	4.9	0.54	1.2	10/6/2012	DI					
2,3-dimethylpentane	0.86	0.52	1.2	10/6/2012	L,DI					

Laboratory Analysis Results

Request Number: 1210011

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1210011-001									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
3-methylhexane	4.9	0.40	1.2	10/6/2012	DI					
1,2-dichloropropane	ND	0.34	1.2	10/6/2012	DI					
trichloroethylene	ND	0.58	1.2	10/6/2012	DI					
2,2,4-trimethylpentane	ND	0.48	1.2	10/6/2012	DI					
2-chloropentane	ND	0.54	1.2	10/6/2012	DI					
n-heptane	12	0.50	2.4	10/6/2012	DI					
c-1,3-dichloropropylene	ND	0.40	1.2	10/6/2012	DI					
methylcyclohexane	10	0.52	2.4	10/6/2012	DI					
t-1,3-dichloropropylene	ND	0.40	1.2	10/6/2012	DI					
1,1,2-trichloroethane	ND	0.42	1.2	10/6/2012	DI					
2,3,4-trimethylpentane	0.09	0.48	2.4	10/6/2012	J,DI					
toluene	5.5	0.54	1.2	10/6/2012	DI					
2-methylheptane	12	0.40	2.4	10/6/2012	DI					
3-methylheptane	9.9	0.46	2.4	10/6/2012	DI					
1,2-dibromoethane	ND	0.40	1.2	10/6/2012	DI					
n-octane	20	0.76	4.8	10/12/2012	D2					
tetrachloroethylene	ND	0.48	1.2	10/6/2012	DI					
chlorobenzene	ND	0.54	1.2	10/6/2012	DI					
ethylbenzene	0.99	0.54	2.4	10/6/2012	L,DI					
m & p-xylene	19	0.54	4.8	10/6/2012	DI					
styrene	ND	0.54	2.4	10/6/2012	DI					
1,1,2,2-tetrachloroethane	ND	0.40	1.2	10/6/2012	DI					
o-xylene	4.2	0.54	2.4	10/6/2012	DI					
n-nonane	24	0.88	2.4	10/12/2012	D2					
isopropylbenzene	0.23	0.48	1.2	10/6/2012	J,DI					
n-propylbenzene	0.82	0.54	1.2	10/6/2012	L,DI					
m-ethyltoluene	2.5	0.22	1.2	10/6/2012	DI					
p-ethyltoluene	0.79	0.32	2.4	10/6/2012	L,DI					
1,3,5-trimethylbenzene	5.5	0.50	2.4	10/6/2012	DI					
o-ethyltoluene	0.59	0.26	2.4	10/6/2012	L,DI					
1,2,4-trimethylbenzene	6.2	0.54	1.2	10/6/2012	DI					
n-decane	19	0.54	2.4	10/6/2012	DI					
1,2,3-trimethylbenzene	1.3	0.54	1.2	10/6/2012	DI					
m-diethylbenzene	0.19	0.54	2.4	10/6/2012	J,DI					
p-diethylbenzene	1.4	0.54	1.2	10/6/2012	DI					
n-undecane	11	0.54	2.4	10/6/2012	DI					

Laboratory Analysis Results

Request Number: 1210011

Analysis Code: AP001VOC

Qualifier Notes:

ND - not detected
NQ - concentration can not be quantified due to possible interferences or coelutions.
SDL - Sample Detection Limit (Limit of Detection adjusted for dilutions).
SQL - Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Compound and/or results is tentatively identified.
F - Established acceptance criteria was not met due to factors outside the laboratory's control.
H - Not all associated hold time specifications were met. Data may be biased.
C - Sample received with a missing or broken custody seal.
R - Sample received with a missing or incomplete chain of custody.
I - Sample received without a legible unique identifier.
G - Sample received in an improper container.
U - Sample received with insufficient sample volume.
W - Sample received with insufficient preservation.

Quality control notes for AP001VOC samples.

D1-Sample concentration was calculated using a dilution factor of 4.
D2-Sample concentration was calculated using a dilution factor of 8.

TCEQ laboratory customer support may be reached at Cindy.Maresh@tceq.texas.gov

Table 2. Comparison of Monitored Concentrations in Lab Sample 1210011-001 to TCEQ Short-Term AMCVs

Lab Sample ID	1210011-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
1,1,1-Trichloroethane	380,000	1,700	1.2	0.01	J,D1	0.52
1,1,2,2-Tetrachloroethane	7,300	10	1.2	ND	D1	0.4
1,1,2-Trichloroethane	Not Available	100	1.2	ND	D1	0.42
1,1-Dichloroethane	110,000	1,000	1.2	ND	D1	0.38
1,1-Dichloroethylene	Not Available	180	1.2	0.01	J,D1	0.36
1,2,3-Trimethylbenzene	Not Available	250	1.2	1.3	D1	0.54
1,2,4-Trimethylbenzene	Not Available	250	1.2	6.2	D1	0.54
1,2-Dibromoethane	10,000	0.5	1.2	ND	D1	0.4
1,2-Dichloroethane	6,000	40	1.2	0.02	J,D1	0.54
1,2-Dichloropropane	250	100	1.2	ND	D1	0.34
1,3,5-Trimethylbenzene	Not Available	250	2.4	5.5	D1	0.5
1,3-Butadiene	230	1,700	1.2	ND	D1	0.54
1-Butene	360	50,000	1.2	0.32	J,D1	0.4
1-Pentene	100	2,600	1.2	ND	D1	0.54
2,2,4-Trimethylpentane	Not Available	750	1.2	ND	D1	0.48
2,2-Dimethylbutane (Neohexane)	Not Available	1,000	1.2	0.17	J,D1	0.42
2,3,4-Trimethylpentane	Not Available	750	2.4	0.09	J,D1	0.48
2,3-Dimethylbutane	Not Available	990	2.4	0.28	J,D1	0.56
2,3-Dimethylpentane	Not Available	850	1.2	0.86	L,D1	0.52
2,4-Dimethylpentane	290,000	850	2.4	0.34	J,D1	0.54
2-Chloropentane (as chloroethane)	Not Available	190	1.2	ND	D1	0.54
2-Methyl-1-Pentene +1-Hexene	20	500	4.8	ND	D1	0.4
2-Methyl-2-Butene	250	500	1.2	0.01	J,D1	0.46
2-Methylheptane	Not Available	750	2.4	12	D1	0.4

Lab Sample ID	1210011-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
2-Methylhexane	Not Available	750	1.2	4.9	D1	0.54
2-Methylpentane (Isohexane)	83	1,000	1.2	2.7	D1	0.54
3-Methyl-1-Butene	250	8,000	1.2	ND	D1	0.46
3-Methylheptane	Not Available	750	2.4	9.9	D1	0.46
3-Methylhexane	Not Available	750	1.2	4.9	D1	0.4
3-Methylpentane	Not Available	1,000	1.2	2	D1	0.46
4-Methyl-1-Pentene (as hexene)	20	500	2.4	ND	D1	0.44
Acetylene	620,000	25,000	2.4	0.93	J,T,D1	1
Benzene	2,700	180	1.2	1.1	L,D1	0.54
Bromomethane (methyl bromide)	21,000	30	1.2	0.01	J,D1	0.54
c-1,3-Dichloropropylene	Not Available	10	1.2	ND	D1	0.4
c-2-Butene	2,100	15,000	1.2	0.01	J,D1	0.54
c-2-Hexene	Not Available	500	2.4	ND	D1	0.54
c-2-Pentene	Not Available	2,600	2.4	ND	D1	0.5
Carbon Tetrachloride	97,000	20	1.2	0.09	J,D1	0.54
Chlorobenzene (phenyl chloride)	210	100	1.2	ND	D1	0.54
Chloroform (trichloromethane)	85,000	20	1.2	ND	D1	0.42
Cyclohexane	420	1,000	1.2	3.1	D1	0.48
Cyclopentane	Not Available	1,200	1.2	0.2	J,D1	0.54
Cyclopentene	Not Available	2,900	1.2	0.01	J,D1	0.4
Dichlorodifluoromethane	Not Available	10,000	1.2	0.51	L,D1	0.4
Ethane	180,000	Simple Asphyxiant*	2.4	36	T,D1	1
Ethylbenzene	170	20,000	2.4	0.99	L,D1	0.54
Ethylene	270,000	500,000	2.4	1.7	L,T,D1	1
Isobutane	2,040	8,000	2.4	1.7	L,D1	0.46

Lab Sample ID	1210011-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Isopentane (2-methylbutane)	1,300	68,000	4.8	2.6	L,D1	0.54
Isoprene	5	20	1.2	0.06	J,D1	0.54
Isopropylbenzene (cumene)	100	500	1.2	0.23	J,D1	0.48
m & p-Xylene (as mixed isomers)	80	1,700	4.8	19	D1	0.54
m-Diethylbenzene	70	460	2.4	0.19	J,D1	0.54
Methyl Chloride (chloromethane)	Not Available	500	1.2	0.68	L,D1	0.4
Methylcyclohexane	150	4,000	2.4	10	D1	0.52
Methylcyclopentane	1,700	750	2.4	1.4	L,D1	0.54
Methylene Chloride (dichloromethane)	160,000	3,500	1.2	0.06	J,D1	0.28
m-Ethyltoluene	18	250	1.2	2.5	D1	0.22
n-Butane	1,200,000	8,000	2.4	2.9	D1	0.4
n-Decane	620	1,750	2.4	19	D1	0.54
n-Heptane	670	850	2.4	12	D1	0.5
n-Hexane	1,500	1,800	2.4	5.7	D1	0.4
n-Nonane	2,200	2,000	2.4	24	D2	0.88
n-Octane	1,700	750	4.8	20	D2	0.76
n-Pentane	1,400	68,000	4.8	3.2	L,D1	0.54
n-Propylbenzene	3.8	250	1.2	0.82	L,D1	0.54
n-Undecane	Not Available	550	2.4	11	D1	0.54
o-Ethyltoluene	Not Available	250	2.4	0.59	L,D1	0.26
o-Xylene	380	1,700	2.4	4.2	D1	0.54
p-Diethylbenzene	0.39	460	1.2	1.4	D1	0.54
p-Ethyltoluene	8.3	250	2.4	0.79	L,D1	0.32
Propane	1,500,000	Simple Asphyxiant*	2.4	5.8	T,D1	1
Propylene	13,000	Simple Asphyxiant*	2.4	0.32	J,T,D1	1

Lab Sample ID	1210011-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Styrene	25	5,100	2.4	ND	D1	0.54
t-1,3-Dichloropropylene	Not Available	10	1.2	ND	D1	0.4
t-2-Butene	2,100	15,000	1.2	ND	D1	0.36
t-2-Hexene	Not Available	500	2.4	ND	D1	0.54
t-2-Pentene	Not Available	2,600	2.4	ND	D1	0.54
Tetrachloroethylene	770	1,000	1.2	ND	D1	0.48
Toluene	170	4,000	1.2	5.5	D1	0.54
Trichloroethylene	3,900	100	1.2	ND	D1	0.58
Trichlorofluoromethane	5,000	10,000	1.2	0.26	J,D1	0.58
Vinyl Chloride	Not Available	26,000	1.2	ND	D1	0.34

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.
ppb_v - Parts per billion by volume.
ND - Not detected.
NQ - Concentration cannot be quantified.
SDL - Sample Detection Limit (LOD adjusted for dilutions).
SQL – Sample Quantitation Limit (Limit of Quantitation adjusted fir dilution)
INV - Invalid.
J - Reported concentration is below SDL.
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D1- Sample concentration was calculated using a dilution factor of 4.
D2 – Sample concentration was calculated using a dilution factor of 8.

Table 3. TCEQ Long-Term Air Monitoring Comparison Values (AMCVs)

Please Note: The long-term AMCVs are provided for informational purposes only because it is scientifically inappropriate to compare short-term monitored values to the long-term AMCV.

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
1,1,1-Trichloroethane	940	Cyclopentane	120
1,1,2,2-Tetrachloroethane	1	Cyclopentene	290
1,1,2-Trichloroethane	10	Dichlorodifluoromethane	1,000
1,1-Dichloroethane	100	Ethane	Simple Asphyxiant*
1,1-Dichloroethylene	86	Ethylbenzene	450
1,2,3-Trimethylbenzene	25	Ethylene**	5,300
1,2,4-Trimethylbenzene	25	Isobutane	800
1,2-Dibromoethane	0.05	Isopentane (2-methylbutane)	8,000
1,2-Dichloroethane	1	Isoprene	2
1,2-Dichloropropane	10	Isopropylbenzene (cumene)	50
1,3,5-Trimethylbenzene	25	m & p-Xylene (as mixed isomers)	140
1,3-Butadiene	9.1	m-Diethylbenzene	46
1-Butene	Not Available	Methyl Chloride (chloromethane)	50
1-Pentene	Not Available	Methylcyclohexane	400
2,2,4-Trimethylpentane	75	Methylcyclopentane	75
2,2-Dimethylbutane (Neohexane)	100	Methylene Chloride (dichloromethane)	100
2,3,4-Trimethylpentane	75	m-Ethyltoluene	25
2,3-Dimethylbutane	99	n-Butane	800
2,3-Dimethylpentane	85	n-Decane	175
2,4-Dimethylpentane	85	n-Heptane	85
2-Chloropentane (as chloroethane)	19	n-Hexane	190
2-Methyl-1-Pentene +1-Hexene	50	n-Nonane	200

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
2-Methyl-2-Butene	50	n-Octane	75
2-Methylheptane	75	n-Pentane	8,000
2-Methylhexane	75	n-Propylbenzene	25
2-Methylpentane (Isohexane)	100	n-Undecane	55
3-Methyl-1-Butene	800	o-Ethyltoluene	25
3-Methylheptane	75	o-Xylene	140
3-Methylhexane	75	p-Diethylbenzene	46
3-Methylpentane	100	p-Ethyltoluene	25
4-Methyl-1-Pentene (as hexene)	50	Propane	Simple Asphyxiant*
Acetylene	2,500	Propylene	Simple Asphyxiant*
Benzene	1.4	Styrene	110
Bromomethane (methyl bromide)	3	t-1,3-Dichloropropylene	1
c-1,3-Dichloropropylene	1	t-2-Butene	Not Available
c-2-Butene	Not Available	t-2-Hexene	50
c-2-Hexene	50	t-2-Pentene	Not Available
c-2-Pentene	Not Available	Tetrachloroethylene***	3.8
Carbon Tetrachloride	2	Toluene	1,100
Chlorobenzene (phenyl chloride)	10	Trichloroethylene	10
Chloroform (trichloromethane)	2	Trichlorofluoromethane	1,000
Cyclohexane	100	Vinyl Chloride	0.45

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.
**Long-term vegetation AMCV for Ethylene is 30 ppb.
***Long-term vegetation AMCV for Tetrachloroethylene is 12 ppb.